

**REMARKS**

Reconsideration and allowance of the subject application are respectfully requested. Claims 1, 10, 12-14, 21-29, 39, 40, and 84 are now pending, claim 1 being the sole independent claim. In this Reply, Applicants have made minor amendments to the specification, cancelled claims 2-9, 11, 15-20, 30-38, and 41-83 without prejudice or disclaimer, and have amended claims 1, 12, 14, 21, 24-29, and 40. Applicants have cancelled claims in this Reply to simplify the issues for this application. Such cancellation of claims should not be considered as an acquiescence to any of the objections/rejections set forth in the Office Action. Applicants appreciate the Examiner's careful consideration of this application.

**Objection to the Drawings**

As stated on page 2 of the Office Action, the Examiner objects to the drawings under 37 C.F.R. § 1.83(a), stating that certain claim features are not shown in the drawings. Applicants reply as follows:

Regarding claim 7, this claim has been cancelled. Furthermore, although the Examiner asserts that the stacking of low dispersive and high dispersive media in the claimed reflective part is not shown in the drawings, Applicants direct the Examiner's attention to stacked elements 33 (high dispersive medium) and 32 (low dispersive medium) in Figs. 8 and 9.

Regarding claim 47, this claim has also been cancelled. Furthermore, although the Examiner asserts that an embodiment showing the reflecting optical part directing light through one exit pupil to the center of the reflecting part, and light through another exit pupil

directed to the periphery of the reflecting part is not found in the drawings, Applicants direct the Examiner's attention to Fig. 49, which clearly shows this feature.

Regarding claim 54, this claim has also been cancelled. Furthermore, although the Examiner asserts that the claimed arrangement wherein the optical axis is higher than the intersection point of the relay lens is not shown in the drawings, Applicants direct the Examiner's attention to Fig. 68 (illustrating aspects of embodiment 17) which clearly illustrates this feature.

Regarding claim 63, this claim has also been cancelled.

Regarding claim 68, this claim has also been cancelled. Furthermore, although the Examiner asserts that a temperature sensor for sensing an environment temperature is not shown in the drawings, Applicants direct the Examiner's attention to elements 158 and 159 of Fig. 76, which clearly illustrate this feature.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the objections to the drawings.

### **Claim Objections**

As set forth on pages 3-4 of the Office Action, the Examiner objects to claims 16, 24-27, 29, 42, 61, 65, and 66 based on a number of informalities.

As noted above, claims 16, 42, 61, 65, and 66 are no longer pending in this application. Regarding claims 24-27, these claims have been amended to depend directly from claim 1. Applicants submit that claims 24-27 properly depend from claim 1. Regarding claim 29, Applicants have made the appropriate correction.

**Rejection Under 35 U.S.C. § 112, First Paragraph**

Claims 32, 33, 46, and 63 stand rejected under 35 U.S.C. § 112, first paragraph as allegedly containing subject matter not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Initially, with regard to claims 32, 33, and 63, Applicants note that these claims have been cancelled.

Regarding claim 46, this claim has also been cancelled. Furthermore, Applicants again direct the Examiner's attention to Fig. 49 and the description of the thirteenth embodiment in the specification, which provide an enabling description for the features of claim 46.

In view of the above, Applicants respectfully request that the rejection under 35 U.S.C. § 112, first paragraph, be withdrawn.

**Rejection Under 35 U.S.C. § 112, Second Paragraph**

Claims 8, 22, 23, 44-46, 51-56, 58-63, 67, and 77-83 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Initially, Applicants note that claims 8, 44-46, 51-56, 58-63, 67, and 77-83 are no longer pending in this application.

Regarding the grounds for alleged indefiniteness set forth for claims 21, 22, and 23 on pages 5-6 of the Office Action, Applicants have amended claim 21 in a manner which is believed to fully address the Examiner's concerns. More particularly, with regard to claim

21, the phrase "composed of" has been replaced with the open term "having", such that claims 22 and 23 (each depending directly from claim 21) further limit the retro-focus optical system element recited in claim 21.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 112, second paragraph.

### **Prior Art Rejections**

1. Masaaki

Claims 1, 2, 4, 5, 7-12, 14-16, 18, 19, 28, 30-38, 41-44, 47, 48, 74, 75, and 81 stand rejected under 35 U.S.C. § 102(b) as being anticipated by JP 9138349 to *Masaaki* (hereinafter "*Masaaki*"). This rejection is respectfully traversed.

Independent claim 1 is directed to an image display device comprising: an optical imaging arrangement for providing image information to illumination light and for transmitting the light as an optical image signal; a display for receiving the optical image signal and for displaying an image based on the image information; and a projecting optical arrangement including a reflecting part for reflecting the optical image signal, and a refracting optical part for correcting for an aberration of the reflecting part and for projecting the optical image signal onto the reflecting part. The display of claim 1 receives the optical image signal through the projecting optical arrangement.

Thus, according to the claimed invention, a refracting optical part corrects for aberrations of the reflecting part included in the projecting optical arrangement.

In contrast, *Masaaki* discloses an optical arrangement in which a mirror (reflecting part) corrects aberrations produced by a lens 13 (refracting part). This can clearly be seen in the attached translation of *Masaaki*. See e.g., the Abstract. With reference to paragraph

number [0024] of the English translation of *Masaaki*, aberration does not occur at the mirror (reflecting part) of *Masaaki*. Thus, *Masaaki* does not describe an arrangement in which a refracting part corrects aberrations occurring at a reflecting part of the optical configuration.

According to MPEP §2131, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ...claims." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913 (Fed. Cir. 1989). The elements must be arranged as required by the claims, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 ( Fed. Cir. 1990).

Applicants respectfully submit that the Office Action has failed to establish the required *prima facie* case of anticipation because the cited reference, *Masaaki*, fails to teach or suggest each and every feature as set forth in the claimed invention.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 102.

2. Sato

Claims 21-27, 29, 39, 40, and 76 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,716,118 to *Sato et al.* (hereinafter "*Sato*"). This rejection is respectfully traversed.

As stated on page 9 of the Office Action, the Examiner relies on *Sato* as allegedly teaching the incremental features of the above-listed claims. Claim 76 is no longer pending. Furthermore, Applicants note that claims 21-27, 29, 39, and 40 depend, either

directly or indirectly, from claim 1. The features of claim 1, however, have not been addressed in the rejection of the dependent claims under 35 U.S.C. § 102. Furthermore, Applicants submit that *Sato* fails to make up for the deficiencies of *Masaaki* discussed above with regard to claim 1.

Consequently, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 102 based on *Sato*.

3. *Masaaki - van den Brandt*

Claim 3 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Masaaki* in view of U.S. Patent 4,969,730 to *van den Brandt* (hereinafter "*van den Brandt*"). This rejection is respectfully traversed.

As set forth on pages 9-10 of the Office Action, the Examiner relies on *van den Brandt* as allegedly teaching the incremental features of claim 3. Applicants respectfully submit, however, that *van den Brandt* fails to make up for the deficiencies of *Masaaki* discussed above with regard to base claim 1. Therefore, Applicants submit that the asserted modification of *Masaaki* in view of *van den Brandt* (assuming these references are combinable, which Applicants do not admit), fails to establish *prima facie* obviousness of any pending claim. Also, Applicants note that claim 3 is no longer pending.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 103.

4. Masaaki - Tejima

Claim 6 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Masaaki* in view of U.S. Patent 5,274,406 to *Tejima et al.* (hereinafter "*Tejima*"). This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

As set forth on page 10 of the Office Action, the Examiner relies on *Tejima* as allegedly teaching the incremental features of claim 6. Applicants submit, however, that *Tejima* fails to make up for the deficiencies of *Masaaki* discussed above with regard to claim 1. Therefore, Applicants respectfully submit that the asserted modification of *Masaaki* in view of *Tejima* (assuming these references are combinable, which Applicants do not admit) fails to establish *prima facie* obviousness of any pending claim. Also, Applicants note that claim 6 is no longer pending.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection based on the asserted combination of *Masaaki* and *Tejima*.

5. Masaaki - Sarofeen

Claims 17 and 57 stand rejected under 35 U.S.C. § 103 as being unpatentable over *Masaaki* in view of U.S. Patent 3,938,775 to *Sarofeen* (hereinafter "*Sarofeen*"). This rejection is respectfully traversed.

As stated on pages 10-11 of the Office Action, the Examiner relies on *Sarofeen* as allegedly teaching the incremental features of claims 17 and 57. Applicants submit, however, that *Sarofeen* fails to make up for the deficiencies of *Masaaki* discussed above with regard to independent claim 1. Therefore, the asserted modification of *Masaaki* in view of *Sarofeen* (assuming these references are combinable, which Applicants do not

admit) fails to establish *prima facie* obviousness of any pending claim. Also, Applicants note that claims 17 and 57 are no longer pending.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the Examiner's rejection based on the asserted combination of *Masaaki* and *Sarofeen*.

6. *Masaaki - Hiller*

Claim 20 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Masaaki* in view of U.S. Patent 6,233,024 to *Hiller et al.* (hereinafter "*Hiller*"). This rejection is respectfully traversed.

As set forth on page 11 of the Office Action, the Examiner relies on *Hiller* as allegedly teaching the incremental features of claim 20. Applicants submit, however, that *Hiller* fails to make up for the deficiencies of *Masaaki* discussed above with regard to claim 1. Therefore, the asserted modification of *Masaaki* in view of *Hiller* (assuming these references are combinable, which Applicants do not admit) fails to establish *prima facie* obviousness of any pending claim. Also, Applicants note that claim 20 is no longer pending.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 based on the asserted combination of *Masaaki* and *Hiller*.

**CONCLUSION**

Should there be any outstanding matters which need to be resolved in the present application, we respectfully request the Examiner to contact the undersigned at (703) 205-




8000, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Applicants respectfully petition for a two (2) month extension of time pursuant to 37 C.F.R. §§ 1.17 and 1.136(a). A check in the amount of \$400.00 in payment of the extension of time fee is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version With Markings to Show Changes Made

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION:**

The specification has been amended as follows:

Please replace the paragraph beginning on page 3, line 24, with the following rewritten paragraph:

--According to another aspect of the present invention, there is provided an image display device which comprises projecting optical means composed of a reflecting part having a reflecting surface for reflecting the optical image signal, and a refracting optical part having a refracting surface for projecting [said] the optical image signal onto [said] the reflecting part, and wherein the display means receives the optical image signal through the projecting optical means and at least one of the reflecting surface and the refracting surface is aspherical.--

Please replace the paragraph beginning on page 5, line 14, with the following rewritten paragraph:

--According to another aspect of the present invention, the refracting optical part is provided with positive lenses of positive power, negative lenses of negative power having a refractive index lower than that of the positive lens, and a Petzval's sum correcting lens for correcting for a Petzval's sum contributing component of [said] the reflecting part.--

Please replace the paragraph beginning on page 6, line 12, with the following rewritten paragraph:

--According to another aspect of the present invention, a light receiving surface of [said] the display means and a reflecting surface of [said] the plane mirror are held in parallel to each other.--

Please replace the paragraph beginning on page 12, line 6, with the following rewritten paragraph:

--According to another aspect of the present invention, the optical axis of the converging optical system principal part is parallel to the [lightreceiving] light receiving surface of the display means and the bottom.--

Please replace the paragraph beginning on page 12, line 9, with the following rewritten paragraph:

--According to another aspect of the present invention, the optical axis of the converging optical system principal part is parallel to the [lightreceiving] light receiving surface of the display means and is tilted so that the intersection point of the illumination light source part and the optical axis is higher than the intersection point of the relay lens and the optical axis in the vertical direction.--

Please replace the paragraph beginning on page 17, line 16, with the following rewritten paragraph:

--According to another aspect of the present invention, the image display device further comprises a connector having a first end face for connection with either one of the left- and right-hand parallel surfaces, a second end face for connection to that one of the

perpendicular surfaces on the same side of [said] the either one of the parallel surfaces, and a connection face parallel to the second end face. The connection surface is coupled to a connection face of another connector.--

Please replace the paragraph beginning on page 24, line 16, with the following rewritten paragraph:

--Fig. 66 is a diagram depicting an illumination [ligh] light source system with its optical axis tilting.--

Please replace the paragraph beginning on page 78, line 13, with the following rewritten paragraph:

--Fig. 49 illustrates the configuration of the image display device according to this embodiment. Reference numeral 91 denotes a refracting optical lens (refracting optical part); 92 denotes a convex mirror with its peripheral portion warped; 93 denotes a convex mirror with the warp of its peripheral portion corrected; 94 denotes the optical axis common to the refracting optical lens 91 [an] and the convex mirrors 92 and 93; 95 denotes an emitted ray near the optical axis; 96 a ray reflected by the convex mirror from its peripheral portion; 97 denotes [exist] exit pupil of the refracting optical lens 91 for the emitted ray 95; 98 denotes the exit pupil of the refracting optical lens 91 for the reflected ray 96; and 99 denotes a ray from the peripheral portion in the case of emanation from the exit pupil 97.--

Please replace the paragraph beginning on page 112, line 7, with the following rewritten paragraph:

--Further, according to this embodiment, since the screwing parts 136, 137 and 138 are held in contact with the front surface 134F of the convex mirror 134 through the convex mirror [mounting mechanisms] mounting mechanisms 140 and 142, the reflecting surface of the convex mirror 134 can be disposed with high precision.--

**IN THE CLAIMS:**

Claims 2-9, 11, 15-20, 30-38, and 41-83 have been cancelled without prejudice or disclaimer to the subject matter recited therein.

The claims have been amended as follows:

1. (Amended) An image display device comprising: [provided with transmitting means]

an optical imaging arrangement for providing image information to illumination light and for transmitting said light as an optical image signal;

a [and] display [means] for receiving said optical image signal and for displaying an image based on said image information[.]; and

[said image display device comprising:]

a projecting optical [means composed of] arrangement including a reflecting part for reflecting said optical image signal, and a refracting optical part for correcting for [a distortion if] an aberration of said reflecting part [has said distortion] and for projecting said optical image signal onto said reflecting part;

wherein said display [means] receives said optical image signal through said projecting optical [means] arrangement.

12. (Amended) The image display device according to claim 1, wherein said refracting optical part is provided with a curvature-of-field correcting [means] arrangement for canceling a curvature of field of said reflecting part.

14. (Amended) The image display device according to claim 1, wherein said projecting optical [means] arrangement has an aspherical optical surface at places where principal rays of said optical image signal to be projected onto the reflecting part from said [transmitting means] optical imaging arrangement are divergent and/or convergent.

21. (Amended) The image display device according to claim 1, wherein said refracting optical part comprises:

a retro-focus optical system [composed of] having a positive lens group of positive power and a negative lens group of negative power; and

a refracting optical lens for fine-tuning the angle of emission of said optical image signal from said retro-focus optical system to said reflecting part.

24. (Amended) The image display device according to claim [12] 1, wherein said refracting optical part comprises:

negative lenses having an average value of refractive indexes in the range of 1.45 to 1.722 and having negative power; and

positive lenses having an average value of refractive indexes in the range of 1.722 to 1.9 and having positive power.

25. (Amended) The image display device according to claim [12] 1, wherein said refracting optical part comprises:

negative lenses having an average value of Abbe's number in the range of 25 to 38 and having negative power; and

positive lenses having an average value of Abbe's number in the range of 38 to 60 and having positive power.

26. (Amended) The image display device according to claim [12] 1, wherein said refracting optical part comprises positive lenses made of refractive materials and negative lenses made of refractive materials, the difference between average refractive indexes of said refractive materials for said positive and negative lenses is in the range of 0.04 to 1.

27. (Amended) The image display device according to claim [12] 1, wherein said refracting optical part comprises positive lenses made of refractive materials and negative lenses made of refractive materials, the difference between average Abbe's number of said refractive materials for said positive and negative lenses is in the range of 0 to 16.

28. (Amended) The image display device according to claim 1, wherein a back focal length from the closest one of a plurality of lenses forming said refracting optical part to a light emitting surface of said [transmitting means] optical imaging arrangement to said light emitting surface is equal to the distance from said light emitting surface of said [transmitting

means] optical imaging arrangement to the position of an entrance pupil of said refracting optical part.

29. (Amended) The image display device according to claim 1, wherein said projecting optical [means] arrangement has negative lenses of negative power provided at the position of a low marginal ray.

40. (Amended) The image display device according to claim 1, wherein, letting  $h_i$  represent the height of the marginal ray of light incident to said refracting optical part,  $h_m$  the maximum height of the marginal ray in a positive lens disposed at the center of said refracting optical part and  $h_o$  represent the height of the marginal ray of light emitted from said refracting optical part, said refracting optical part [satisfy] satisfies the relationships  $1.05h_i < h_m < 3h_i$  and  $0.3h_i < h_o < 1h_i$ .

New claim 84 has been added.